

## Light from gamma-ray bursts offers big bang insights

Laboratory contractor Alan Schier adjusts the alignment on the next generation RAPTOR rapid response telescope during fit checking and slew-speed acceptance testing. This telescope array, called RAPTOR-Technicolor, will be the world's first system able to collect simultaneous "color cinematography" of the critical first few minutes of a gamma-ray burst. Photo by Tom Vestrand of Space Science and Applications (ISR-1)



# Shining a light on star nurseries

by Nancy Ambrosiano

A Los Alamos-led team of international researchers offers a novel way of studying the nurseries of the very first stars formed after the Big Bang. The team discovered that reverberations of the visible light from giant explosions called gamma-ray bursts can reveal clues to the early environment just after the Big Bang.

"Just as geologists use seismic waves generated by explosive charges to study the nature of the surrounding rocks, this new discovery will allow astronomers to use the relationship of the gamma-ray burst explosion's light to that generated by the impact of the blast on the surroundings to study the collapsing star's environment," said Tom Vestrand of Space Science and Applications (ISR-1).

To capture the gamma-ray burst's light reverberations and develop their theory, the team compared light measurements from ground-based instruments with data from two NASA satellites. The research was described in the July 13 issue of the journal *Nature*.

"A significant number of gamma ray bursts are generated by the death of massive stars that were born and died before the Universe was 10 percent of its current age. So the reverberations from these explosions provide unique clues about the environments of some of the very first stars," he said.

The team used the Laboratory's system of autonomous robotic telescopes called RAPTOR (RAPid Telescopes for Optical Response) and simultaneous observations of gamma rays by instruments on NASA's Swift satellite and a Russian instrument on NASA's Wind Satellite.

RAPTOR was built by the Los Alamos Thinking Telescopes team headed by Vestrand, an astrophysicist. The project was funded by Los Alamos' Laboratory Directed Research and Development Program.

RAPTOR is a network of robotic observatories. Each observatory typically consists of a wide-field telescope array and a narrow-field telescope mounted on a platform that can swivel to any point in the sky in less than 6

seconds. The telescope platforms are the fastest ever built.

To observe the GRBs' unpredictable, fleeting flashes of light, the RAPTOR telescopes must always be ready to respond to an event that could happen anywhere in the sky in the next minute or next month. When a flash occurs, observations must begin during the critical first minute of the explosion. Human operators with conventional telescopes don't have the attention span and response for that — the only practical option is to do it robotically. When an event does occur, the autonomous RAPTOR robotic telescopes can whip around and begin detailed observations in just a few seconds.

Gamma-ray bursts are brief, intense, flashes of gamma-ray emission, and the most distant ones are now known to signal the birth of a black hole through the cataclysmic collapse of a massive star. While the intense gamma rays are emitted only during the explosion, the new observations show that visible light is emitted both by the explosions and the glowing embers of surrounding material impacted by the blast.

Although today's picture of the first critical minute of a gamma-ray burst is much more complete than it

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Many drivers have been parking in front of the fire-hose connection on the top deck of the parking garage near the Otowi Building. The Laboratory is working with fire protection to design a better guard but needs drivers' cooperation in the meantime. Photo by Krista D. Wilde

## Be safety-conscious in parking garage

Krista D. Wilde

Exercise caution and be aware of safety concerns in the parking garage near the Otowi Building. Carelessness will create safety hazards in this area.

"Drivers and pedestrians in this structure must work together and with Institutional Facilities and Services (MSS-IFCS) to prevent injuries to people and damage to property," said Stephen McCleary of MSS-IFCS.

"The easiest way for Lab employees to promote safety in this parking garage is by reading the posted signs and obeying the rules," McCleary said.

Drivers should never park in the garage illegally, including in areas of the garage that have yellow hash marks. Legal parking spaces are clearly marked with a solid white line on either side, said McCleary.

Another ongoing issue in the garage involves the fire-hose connections on the top deck of the garage. McCleary said these connections, which are attached to the wall in a couple of places, have been hit by vehicles.

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Pat Unkefer, far right, guides Bill Hargraves, left, Feliz Vigil, Jonathan J. Tapia, and Kimberly Zeilik through the Biotechnology, Spectroscopy and Isotope Chemistry (B-3) main lab. Tours like this allow the purchasing experts to see first-hand how the materials they purchase are used. Photo by Ed Vigil

## Barrier Removal Program continues successes of Fix-It Team

by Krista D. Wilde

Want to remove an impediment to getting work done? The Laboratory's Barrier Removal Program can help.

Earlier this summer, Laboratory Director Mike Anastasio announced a process to integrate the Fix-It Team with the new Barrier Removal Program.

The Barrier Removal Program is an automated process that allows employees to report impediments to their work. Lab employees can login at the Web site (<http://NoBarriers.lanl.gov>) using their Z number and Cryptocard.

Chartered more than a year ago, the Fix-It team was organized to address small and immediate issues that were slowing down and impeding work at the Laboratory. The team addressed issues such as clarifying Lab laser safety requirements, decreasing paperwork for taking laptops on foreign travel, and providing healthier snacks in Lab vending machines.

The Barrier Removal Web site has received more than 300 requests for assistance, said Chris Cantwell of the Environment, Safety, Health, and Quality Directorate (ADESHQ).

"The program has increased communication, responsiveness, and personal interaction. Participants in the Barrier Removal Program confirm that the program is facilitating communication so that employees who make requests are kept in the loop and are providing advice and suggestions, a major part of the removal process," said Cantwell.

With interactive support from associate director-level chiefs of staff and process

owners, more than 70 percent of the individual submittals have been closed, Cantwell said. Working with employees who need assistance in resolving an issue, process owners have provided responses on topics ranging from purchasing, contract procurement, computer security, equipment salvage, waste pick-up, JIT systems, facility repairs, training, safety, and travel. Recently, responses and solutions common to submittals on many of these topics were placed on the Web site for anyone to review.

To ensure ongoing communication is maintained, the program is committed to responding within 24 hours (next business day) of receiving a request for assistance, said Cantwell. The submittal is reviewed and assigned, through the appropriate chief of staff, to a subject matter expert who will work on the problem. And each time an action is taken on a request, an e-mail is automatically generated and sent to the stakeholders of that request.

Cantwell added that the Barrier Removal Program will continue to work together and assist the Fix-It team to seek resolution to issues. Employees also can work through the Ombudsman Office to identify barriers.

The Barrier Removal Program Web site is located at <http://NoBarriers.lanl.gov> online. Information about barriers can be sent to [nobarriers@lanl.gov](mailto:nobarriers@lanl.gov) by e-mail or submitted through the Barrier Removal Program Web site. A program description document and related performance data also is available online.

### Problem solved!

When Pat Unkefer of Biotech, Spectroscopy and Isotope Chemistry (BIO-BSIC) and some of her colleagues decided to tackle problems related to the procurement of chemicals, they joined together with the Chemical Inventory Team. They also turned to the Fix-It Team for help.

The procurement issue is very complex, because buying chemicals involves safety issues and accurate inventory of chemicals. On the other hand, the scientists need efficient and immediate procurement response in order to reduce chemical inventories and waste and improve safety. After asking the Fix-It Team for help, the group of chemists was able to work closely with procurement employees.

"The procurement experts were eager to help and were crucial to our success in overcoming this barrier," said Unkefer. "The spirit of everyone we encountered was, 'Let's fix it, how can we help?'"

The Fix-It team helped the chemists get in contact with people who could help them. "Without the Fix-It team's help in engaging and informing senior management of critical issues and opportunities, we would not have been successful," Unkefer said. "The Fix-It team gave us the ability to get in the door and explain it to them."

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## Los Alamos National Laboratory NewsLetter

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Los Alamos enhances national security by ensuring the safety and reliability of the U.S. nuclear stockpile, developing technologies to reduce threats from weapons of mass destruction, and solving problems related to energy, environment, infrastructure, health and global security concerns.



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## Lab employees got help ...

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Unkefer and her group were able to work with a cross-functional team to tackle the problems. The team included Kevin John of Materials Chemistry (MPA-MC), Jonathan Tapia of Institutional Programs (IHP-IP), Bill Hargraves of Information Systems Support (IST-ISS), Kimberly Zeilik and Feliz Vigil of Purchasing (ASM-PUR), Kirk Hollis of Chemical Sciences and Engineering (CHEM-CSE), and Bob Travis of Materials Management (ASM-MM).

The team included employees from diverse areas of the Lab. Unkefer praised this diversity, saying, "The Fix-It team recognizes that the teaming of support and technical staff in a professional manner is essential to solving problems. The Lab does not have simple problems, and only by pooling our resources, ideas, and solutions can we produce outstanding results."

She added that the team developed a pilot program for chemical procurement. The pilot program is a step in preparing to roll out a new procurement process. The pilot program tests the process so that any problems can be worked out before it is launched Labwide.

Unkefer already is thinking about future improvements. "There still is a need to extend our problem-solving teaming activity to include those who will be training designated procurement representatives who will be doing the chemical ordering. We hope to engage with these folks during the pilot project stage," she said.

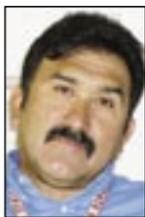


**Q:** The Laboratory's 2007 United Way campaign recently kicked off. How do you feel about charitable giving? Is it something that everyone who is financially able should do and encourage in others, or is charitable giving a personal and private choice?



**Tom Hicks of Acquisition Services Management (ASM-DO)**

I believe in charitable giving to support causes and issues you believe in. I feel it is a personal choice to give or not to give.



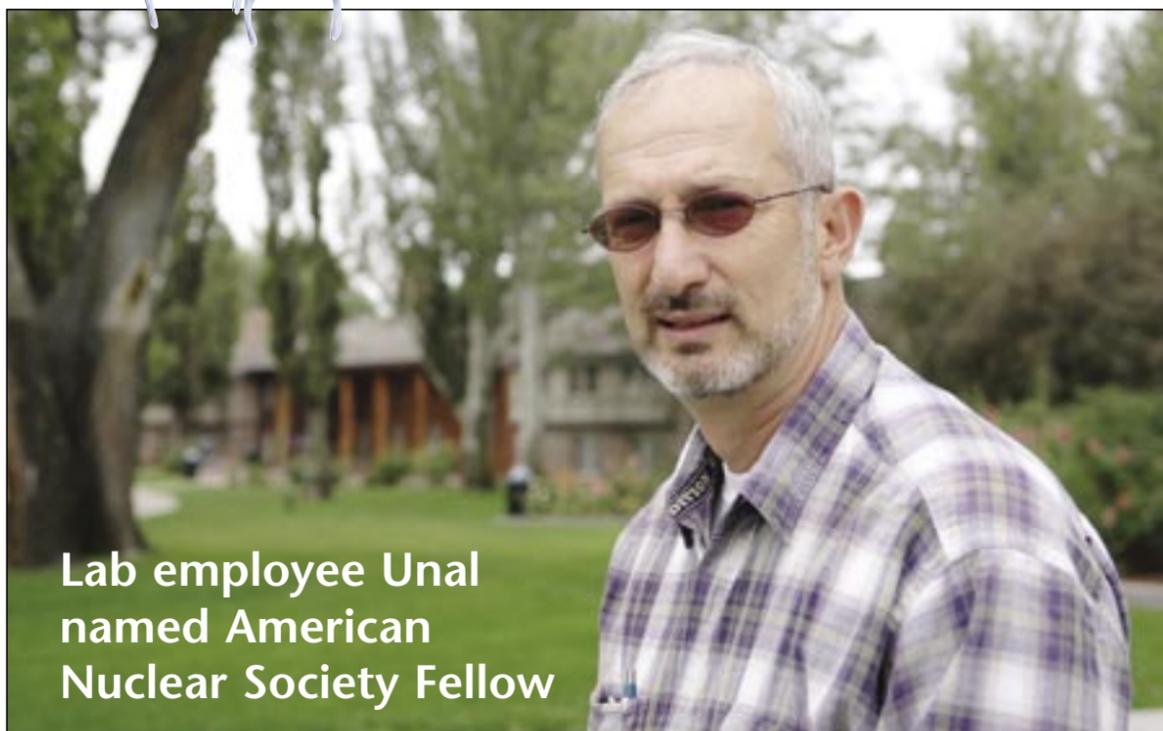
**Tim Martinez of the Community Programs Office (CPO)**

I feel these giving back programs are important, and they are one of my personal priorities. There are many needs in our communities that we as individuals can help with through our generous contributions and support.



**Chris Armijo of ASM-DO**

I personally feel that as Lab employees, we are not only privileged, but also obliged to share our good fortune with those who aren't as fortunate as us. Yes, it is a personal choice and can be a private choice as well. Having had the opportunity to benefit from the comfort and well-wishes of a charitable organization in my past, I have a great desire to give back that support in any way that I can. Charitable giving affords me that opportunity, so I will continue to support it through the Lab's campaign.



## Lab employee Unal named American Nuclear Society Fellow

**C**etin Unal of Navy Systems 1 (X-4-NS1) was awarded Fellow Membership Grade by the American Nuclear Society. Fellow membership is given to ANS members for outstanding accomplishments in nuclear science and engineering.

"Cetin's election to the rank of Fellow within the society recognizes the contributions he has made to the advancement of nuclear science and technology through the years," said ANS President Harold McFarlane.

Unal will be recognized at an awards luncheon in November in Albuquerque.

This is ANS's highest membership grade and fellows are selected based on peer nomination, review by the Honors and Awards Committee, and election by the society's Board of Directors, said McFarlane.

"It is a great honor for me to see that my peers recognized my contributions to nuclear science and technology with the society's highest membership grade. It is a reconfirmation that all the work I have been doing will be remembered," said Unal. "This makes me feel that I contributed to a field providing reliable, safe, and clean energy that may help all of us in the next several decades."

Unal has worked at the Lab since 1989, where he has contributed to the field of thermal hydraulics, heat transfer, and nuclear weapon physics. He also worked as a project leader for the Nuclear Systems Safety team and developed a theory that unifies the controlling mechanisms for critical heat flux and quenching.

He is presently a project leader of weapon certification — including quantification of margins and uncertainties (QMU) — of W76 and 88 systems.

## Shining a light ...

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was only 12 months ago, these cataclysmic explosions continue to surprise astronomers. For example, in a recent event the RAPTOR system autonomously discovered a bright outburst of the visible light almost an hour after a faint triggering burst of gamma rays.

"This tells astronomers that the distant Universe still is hiding powerful explosions that can be discovered only by monitoring millions of steady optical sources," said

Przemek Wozniak of ISR-1. To meet this "needle in a haystack" challenge, astronomers, engineers, and computer scientists at the Laboratory are working together on advanced systems called "thinking" robotic telescopes that merge robotic hardware, modern database technology, and detection algorithms based on "machine learning."

"We are world leaders for this advanced technology thrust that aims to build autonomous thinking sensors and I believe it is likely to have a profound impact on how we help our Nation build instrumentation to recognize and respond to increasingly complex threats," said Vestrand.

## Be safety-conscious ...

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An SUV or large truck could break off the knobs and cause a flood. Currently, barrels are blocking these areas, but drivers are crushing the barrels into the brass connections, he said.

"We are working with fire protection to design a better guard for these hook-ups, but we need drivers' cooperation in the meantime," added McCleary.

"Drivers should slow down when they enter the parking garage," said David Lujan of Operations Support (IHP-OS). Lab employees also should watch for pedestrians when entering, leaving, and driving in the parking garage. Drivers should be aware that pedestrians might cross or walk in areas where people are driving and observe the 5 mph posted speed limits.

However, pedestrians must use proper walkways when entering and leaving the garage, cautioned Joe Romero of Institutional Facilities and Central Services (MSS-IFCS).

Lab employees must not enter the garage if

their vehicle is higher than seven feet. The height limit includes items, such as antennas, that may extend from the trunk lid or roof of vehicles.

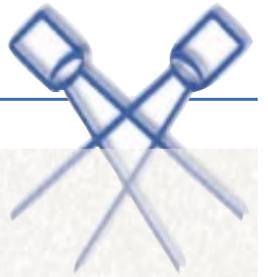
Another potential safety concern is the color of the stop signs. These whited signs are painted on the ground in the garage and are sometimes difficult to see, especially in the early morning and late evening. Thus, drivers should be particularly cautious and aware of all signs.

Don't jump over the barrier at the southeast corner of the basement to walk to the LDCC, Study Center, or University House. Walk around on the sidewalks. Jumping these barriers puts employees at risk for injury, said Lujan.

McCleary also encourages employees to dispose of trash in proper trash receptacles, located near the elevators.

The Lab is working to make the garage safer by adding new barriers, making the stop signs reflective, and adding other safety features.

For more information, contact the IFCS office at 5-2272.



# Freedom on the open seas

by Erik C. Eakins



People find freedom in many different ways. In the *Pirates of the Caribbean* movies, Captain Jack Sparrow finds his freedom as a pirate, sailing the seven seas. Lisa Carlson knows full well this sensation of freedom. Carlson of the Foreign Travel Program Office (STBPO-FTP) spends the majority of her free time sailing with her husband on Heron Lake.

"I've been sailing for the last 10 years for fun and pleasure. Friends invited my husband and me to the lake one weekend, and we were hooked. We came back, bought a boat and have been sailing ever since," said Carlson. "It's exhilarating to be on the water, using the power of nature to glide across the lake."

After working at the Laboratory all week, retreating to Heron Lake to sail is the perfect getaway. Heron Lake is about 75 miles north of Los Alamos off US 84-285. The whole experience is so peaceful with the sun shining down, wind blowing in the sail, and the chilled water spraying up, said Carlson.

Earlier this year, Carlson joined a new organization, the Women on Water Organization in New Mexico. The organization is made up of all-women sailing teams that compete in area competitions.

Carlson and her newly formed team spent weekends practicing at Elephant Butte Lake to prepare for a qualifying round of the Adams Cup Race. Practices consisted of the four-woman team and a coach on a boat running "man overboard" drills, "rounding marks," and practicing "starts." A rounding mark is a point of a race in which the sailors must do a U-turn to head toward either another mark or the finish line. Practicing starts allows the team to gain the experience to have the fastest time off the starting line, she explained.

Carlson's four-woman team successfully competed in a qualifying round of the Adams Cup Race, an all women's Sailing Championship. Though the team didn't qualify out of the Area F Regionals in Austin, Texas, the race was great experience for everyone, said Carlson.

"Sailing with a team of women has really helped me realize what I am capable of doing without a man around. I've been able to learn all the different positions and have gained a lot more confidence in myself as a sailor," said Carlson.

Carlson plans to continue sailing with her team and hopefully continue to compete in the Rio Grande Regattas and the New Mexico Regattas sailing leagues.

The advice Carlson has for other sailors or anybody interested in sailing is to practice. "Grab a boat and get on the water. Come up to Heron Lake because people always need crews. Also, remember to wear a life jacket and always have fun."



*Lisa Carlson of the Foreign Travel Program Office (STBPO-FTP) and her teammates, left boat, successfully competed in a qualifying round of the Adams Cup Race, an all women's Sailing Championship, held at Elephant Butte Lake earlier this year. Photo courtesy of Carlson*